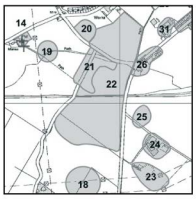
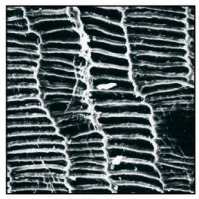
WRFM/01










WATERFORD ROAD, FORRES, MORAY

ARCHAEOLOGICAL WATCHING BRIEF

commissioned by Network Rail

15/02196/APP

January 2017

HEADLAND ARCHAEOLOGY

REGISTERED ORGANISATION CIfA

WATERFORD ROAD, FORRES, MORAY

ARCHAEOLOGICAL WATCHING BRIEF

commissioned by Network Rail

15/02196/APP

January 2017

project info

HA JOB NO.	WRFM/01
NGR	NJ 02841 59186
PARISH	Forres
LOCAL AUTHORITY	Moray Council
OASIS REF.	Headland1-257361

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PROJECT SUMMARY

Headland Archaeology (UK) Ltd undertook a watching brief on ground breaking works associated with the construction of a new road link between the A96 and Waterford Road at Forres by Network Rail. The purpose of the work was to establish the presence of archaeological features or deposits within the area of ground breaking, and to fully record all archaeologically significant features as set out in the CIfA Standards and Guidance documentation.

Several post-holes and pits were uncovered and excavated, including a series of pits relating to the on-site smelting and smithing of iron-ore; and the disposal of waste materials, both agricultural and industrial. These appear Iron-age in date, indicating the possibility of Iron-age settlement in the vicinity.

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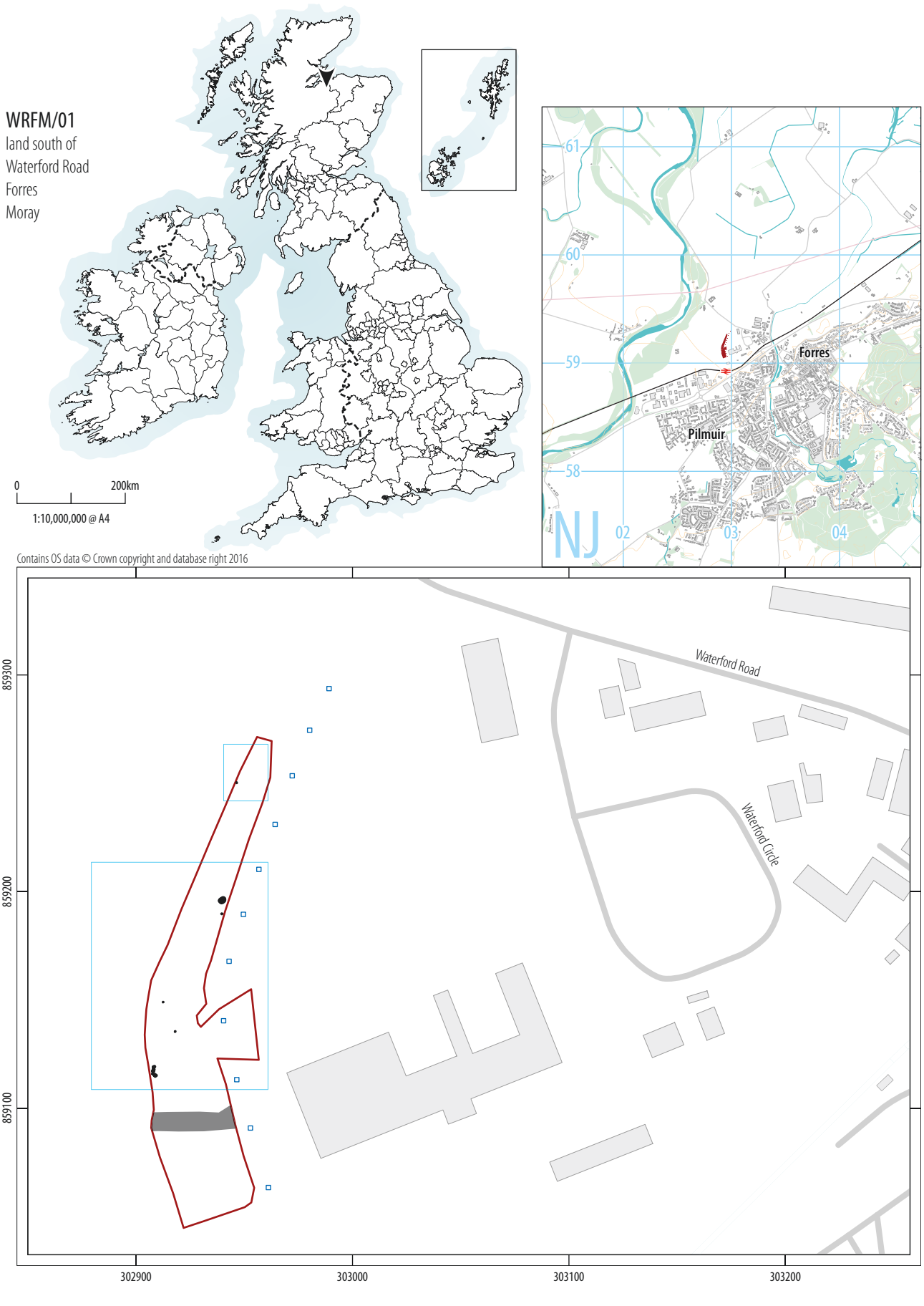

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ILLUS 1 Site location

WATERFORD ROAD, FORRES, MORAY

ARCHAEOLOGICAL WATCHING BRIEF

1 INTRODUCTION

An application for development (15/02196/APP) by Network Rail (the client), for construction of a new road link between the A96 and Waterford Road at Forres has been approved by Moray Council (the LPA). As a condition attached to the approval of the application, an archaeological watching brief was required on ground breaking works associated with the development.

The work was undertaken in two stages. An initial targeted watching brief was carried out during initial ground breaking works. The areas targeted during this period were as follows: firstly a 1,000m^2 section of the proposed road where a high concentration of crop marks were observed on aerial photographs; secondly a series of infiltration test holes along the eastern edge of the road plan. Following the initial works a watching brief was maintained on the remaining ground breaking works associated with the road construction.

The purpose of the work was to establish the presence of archaeological features or deposits within the area of ground breaking, and to fully record all archaeologically significant features as set out in the CIfA Standards and Guidance documentation.

2 SITE LOCATION & DESCRIPTION

The site is located at (NGR NJ 02841 59186). It is currently used as agricultural land. (Illus 1).

The site lies around 10m AOD and is underlain by superficial deposits of clay, silt, sand and gravel formed up to two million years ago during the Quaternary Period. These overlie Alves Formation sandstone sedimentary bedrock formed during the Devonian Period (NERC 2016).

3 ARCHAEOLOGICAL BACKGROUND

The proposed development lies within an open field that has a number of cropmarks identified through aerial photography (Illus 2). The cropmarks are thought to represent the remains of a prehistoric settlement and can be considered to be of regional significance.

Forres itself dates to the medieval period, with a royal castle within the area from AD 900. Forres became a royal burgh in AD 1140. Whilst the site lies outside the medieval core of the town there is some potential for medieval remains to be encountered within the site.

4 AIMS AND OBJECTIVES

The work included an archaeological watching brief on all ground breaking works associated with the development. This was designed to mitigate any adverse impacts on sub-surface remains of archaeological interest.

The resulting archive will be organised and deposited in the NMRS to facilitate access for future research and interpretation for public benefit.

5 METHODOLOGY

5.1 EXCAVATION

All ground breaking works were undertaken by the main contractor. Topsoil and subsoil deposits were removed with a flat bladed ditching bucket.

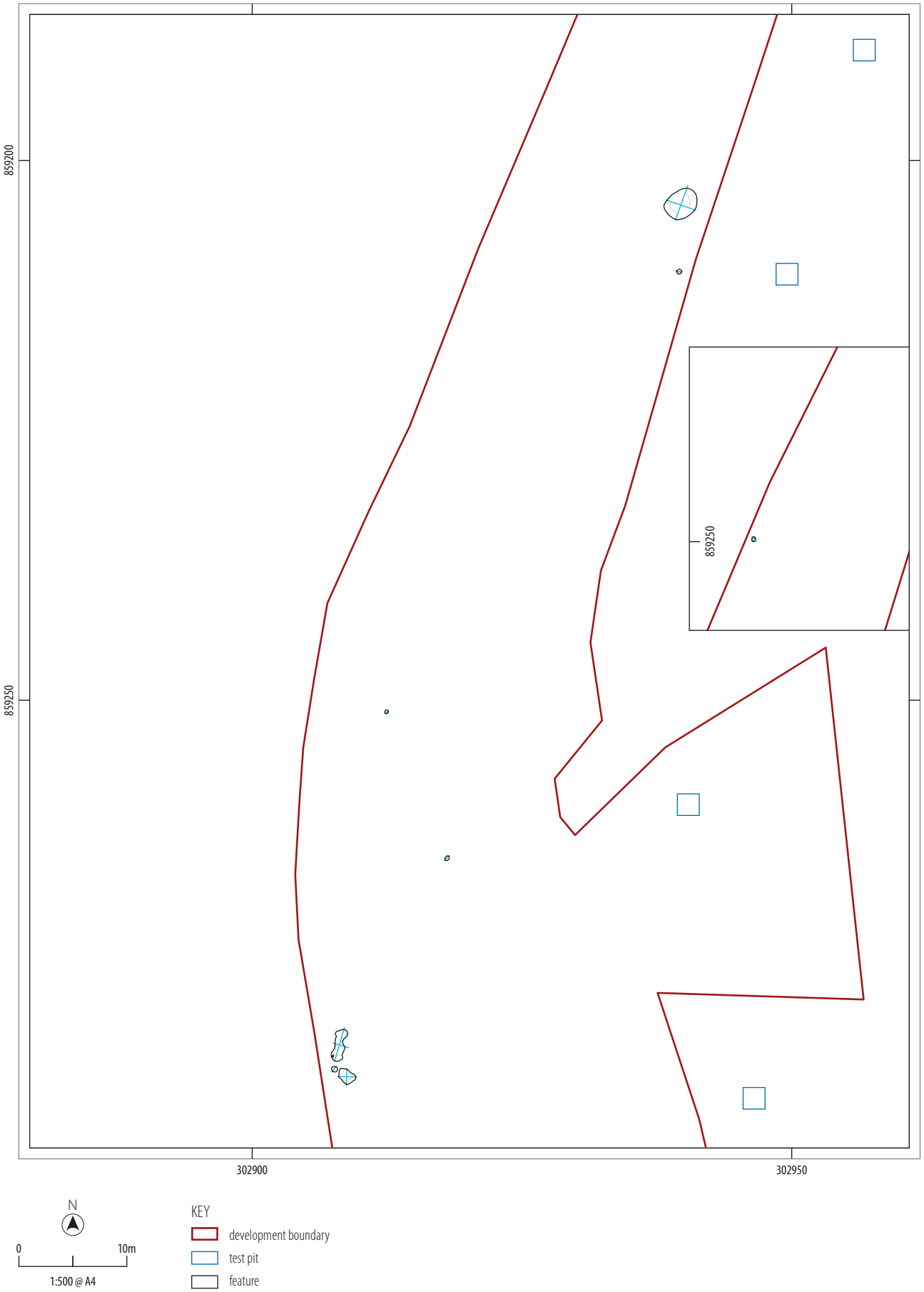
5.2 RECORDING

All archaeological deposits were recorded using standard archaeological methods and pro forma record sheets. Digital photographs were taken. A site plan including identified features and areas of excavation was produced and linked to the National Grid.

6 RESULTS

6.1 GENERAL FINDINGS

The stratigraphic sequence across site followed a uniform pattern. The natural geology was a fine yellow sand with patches of water-



ILLUS 2 Plan showing features

lain cobbles. From the aerial photographs it is apparent that many palaeochannels have passed through this area, which will have had a dramatic effect on the underlying natural deposits, explaining the presence of sand and cobble deposits, along with the mineral deposits formed as a result of water-action.

The topsoil formed two distinct layers: the lower layer appeared to be a deep-ploughing soil of 0.3–0.4m depth – a mixture of the upper plough soil and the natural sands below – and comprised orangey-brown silty sand with manganese deposits; the upper layer was a standard plough soil of 0.3m depth comprising mid-brown silt with manganese deposits throughout.

The haul road was the first area observed on-site (Illus 4). However it was quickly apparent that the depth of excavation was less than 0.3m, therefore not exposing any archaeological horizons. In addition a modern (<50 years) sewage line followed the course of this temporary road, so any archaeological remains would have been disturbed prior to current works. No archaeology was revealed during excavation.

The targeted area of ground breaking was carried out down to a depth of 0.7–0.8m across the area. A small amount of modern pottery was found throughout the topsoil and subsoil. No archaeology was found in this area and the areas that appeared darker in the crop-mark photos represent changes in the underlying geology.

The 11 infiltration-test holes excavated each measured roughly $2m^3$. No archaeology was present in the test holes. (Illus 5)

The watching brief for the link road was carried out to a depth of 0.7–0.8m (Illus 5). Several archaeological features were revealed during this phase, described below. In addition, several modern features were uncovered, including a horse burial, a cow burial and the remains of a fence/post alignment towards the north of site; the cow burial in close proximity to pit [1008] was also likely to be of modern origin. The fence post holes contained broken fence posts in situ. The entire site shows evidence of heavy burrowing into the natural and archaeological deposits.

6.2 ARCHAEOLOGICAL FEATURES

Full context descriptions are included in Appendix 1. Contexts were assigned consecutive numbers for the whole period of works. Cut features are shown as [1001] whilst their fills are expressed as (1002) for example. Measurements are given as 'length x width x depth'. Excavation took place under mixed weather conditions, with showers, some heavy, frequent throughout.

Industrial features

In the southern half of road corridor a grouping of four features were recorded with contained evidence for prehistoric industrial activity.

A large ovoid pit [1008] (Illus 6, 8, 9) was uncovered, measuring 3.35 x 0.91 x 0.23m, it was associated with two smaller pits [1004 and 1006]. Truncated to the south by a later pit [1015] it contained several fills. A basal fill (1012) measuring 1.15 x 0.80 x 0.06m consisted of a charcoal, slag and daub-rich layer of dark grey sandy silt, likely representing furnace rake-out. Separated from this deposit by a large stone was a dark greyish-brown sandy silt (1019) measuring 0.28 x 0.28 x 0.1m, mostly comprised of slag debris is located in the northern end of pit [1008]. This is stratigraphically contemporary with basal fill (1012). Overlying the southern edge of Deposit (1012) was Deposit (1010) measuring 0.8 x 0.8 x 0.06m, consisting of a mid-yellow sand deposit with frequent charcoal flecks. This was interpreted as another probable rake-out deposit).

Directly over Deposit (1010) was a dark brown sandy silt (1011) which contained abundant charcoal with occasional slag and daub fragments. This was overlain by a yellow sand (1013) with frequent charcoal flecks, measuring 0.23 x 0.23 x 0.07m. Deposit (1014) is the final fill of pit [1008]. It measured 3.02 x 0.91 x 0.18m and was a mid-brownish grey sandy silt with abundant charcoal, frequent slag and daub. This may represent rake-out material from a furnace.

Pit [1008] appears to represent an industrial waste pit for rake out material due to the large amount of charcoal and slag-rich deposits layered within this feature.

Cutting Pit [1008] to the south was a smaller feature [1015] that measured 0.65 x 0.65 x 0.22m. A mid-pinkish brown sand (1017) measuring 0.65 x 0.65 x 0.19m is apparent in the base of this re-cut, indicating a further in situ burning event due to the heat-affected nature of the sand. This deposit contained the fragmented remains of structural daub [1009] (not seen in section) measuring 0.25 x 0.20 x 0.05m. This, alongside an abundance of iron slag, suggests that the feature was the cut of an iron-working furnace. The upper fills of the feature comprised a dark brown/black sandy silt (1018) measuring 0.38 x 0.30 x 0.08m, with abundant charcoal and occasional daub and slag and a dark brown sandy silt (1020) containing occasional charcoal flecks, measuring 0.33 x 0.33 x 0.03m.

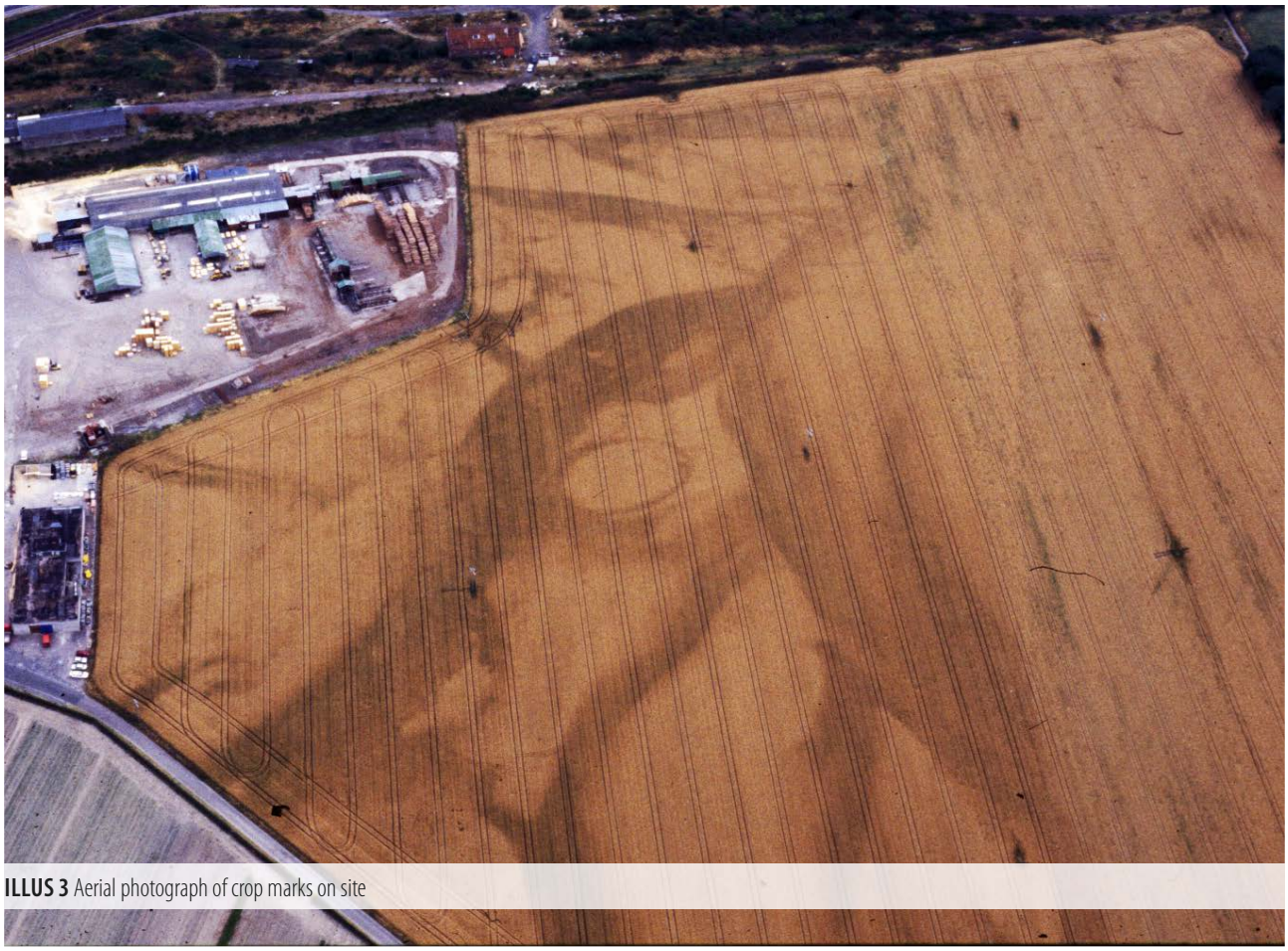
Sub-circular pit [1004] (Illus 7) was flat-based with gentle breaks of slope. It measured 1.6 x 1.3 x 0.13m, and was located 0.8m to the south of industrial spread [1008]. Heavy burrowing has occurred throughout this feature. It contained a fill (1005) comprised of a mid-brown sandy silt with abundant charcoal, occasional slag, structural daub fragments and occasional burnt stones. The mixed nature of the deposit and its association to furnace [1008] suggests this was a single waste pit relating to the furnace.

Sub-circular pit [1006] was located between pits [1004] and [1008], and measured 0.60 x 0.55 x 0.30m. its fill (1005) comprised a mid-brown sandy silt with occasional charcoal and daub fragments, and is similar to fill (1007) suggesting this too could be a waste deposit within a roughly cut pit.

Other features

Approximately 15m to the north-east of the Industrial Features was a circular pit [1025] with gently sloping sides, and an uneven, heavily burrowed base measures 0.53 x 0.50 x 0.15m. Its fill (1026) was a dark-brown sandy silt with abundant charcoal, burnt bone and occasional slag, suggesting a possible association with the industrial features. A secondary fill (1027) of yellowish-brown sandy silt with occasional charcoal flecks overlaid this deposit.

To the north-west of [1025] was a post-hole [1028] (Illus 11). Circular in shape, it measured 0.36 x 0.35 x 0.16m, was steep sided with a flat



ILLUS 3 Aerial photograph of crop marks on site

base and sharp breaks of slope. The post-hole was packed with an orange-yellow sand (1029), and a post-pipe (1030) measuring 0.28 x 0.28 x 0.16m was filled with mid-brown silt, implying the topsoil infilling of the post-hole after removal of the post.

Located approximately 50m north of post-hole [1028] was a sub-rectangular pit [1033] measuring 0.55 x 0.55 x 0.16m with steep sides, a flat base and clear breaks of slope It was filled by a mid-orange brown silty sand with rare charcoal flecks.

Large pit [1021] (Illus 10) was located 8m to the north of the Pit [1033]. It measured 3.10 x 2.75 x 0.42m, was sub-circular pit with gently sloping sides, a flat base and gradual breaks of slope. Its primary fill (1022) was a dark grey/brown sandy silt with abundant charcoal and cereal grain, along with burnt bone and daub, measuring 2.50 x 1.95 x 0.14m. It contained a secondary deposit (1023) of compacted light yellowish-orange silty sand with occasional charcoal, measuring 3.00 x 2.75 x 0.25m. This was overlain by a final deposit (1024) of greyish-orange sandy silt with occasional quartz, slag and charcoal, measuring 3.10 x 2.75 x 0.15m. The varying fills of this pit suggest a possible initial use as a grain storage pit, latterly used as a waste pit for industrial waste.

Post-hole [1031] is the most remote feature on site, located at the north end of the area stripped it measured 0.40 x 0.40 x 0.24m and was sub-circular plan with gentle to steep sides, a pointed base and clear breaks of slope. Its fill (1032) was a mid-brown sandy silt with occasional charcoal flecks.

6.3 FINDS ASSESSMENT

The finds assemblage numbered 15.599kg of ironworking waste with 1.864kg of fired clay, also of industrial origin. The only other find was a single iron object. None of the finds can be tightly dated and the assemblage could date anywhere from the Iron Age to medieval periods. Most of the finds were found in an industrial feature [1008] and in nearby pits [1004], [1006] and [1015], with a few finds from outlying pits [1021] and [1025]. The finds are summarised in Table 1, a complete catalogue is given at the end.

FEATURE	IND. WASTE	CBM	IRON	DATING
	Wgt	Wgt	Count	
Industrial spread 1008	6,472g	515g	–	?
Pit 1004	4,502g	1,281g	–	?
Pit 1006	817g	47g	–	?
Pit 1015	369g	21g	–	?
Pit 1021	3,043g	–	–	?
Pit 1025	5g	–	1	?
Subsoil 1002	391g	–	–	?
Total	15,599g	1,864g	1	

TABLE 1 Summary of finds assemblage by feature

ILLUS 4 SW view of haul road contruction at the south of site **ILLUS 5** S facing view of test-holes along the eastern edge of the road corridor
ILLUS 6 N facing view of stripped road corridor **ILLUS 7** N facing view of excavation of metalworking features [1004] and [1008]

Industrial waste

While no definitive in situ furnace remains were found, it is a possibility that pit [1015] represents the raked out remains of a furnace, though almost nothing of the structure remained. It was cut into a large feature [1008] filled with industrial remains which clearly represent industrial activity. Nearby pits [1004] and [1006] also contained quantities of ironworking waste. Further afield, two pits [1021 and 1025] contained yet more waste.

Much of the slag was undiagnostic in terms of identifying on site processes. However pieces of runned slag were quite commonplace and these are likely to relate to smelting. Two plano-convex hearth cakes were both found in pit [1021]. The small size of one of these (c120mm) implies it derives from smithing, the other larger piece (c180mm) might mean either smithing or smelting.

Magnetic residues retrieved from samples might present hammerscale and were most concentrated in feature [1008] but substantial quantities were also found in other nearby features. The outlying pits [1021] and [1025], despite finds of slag within them contained negligible quantities of magnetic residues.

Ceramic building material

The fired clay fragments all appeared to relate to industrial activity. None bore any traces of wattle impressions suggesting they did not derive from wattle and daub structures. Several of the larger sherds, found in pit [1004] showed clear concave surfaces where they had formed the interior surface of the furnace. These may have lost their internal surfaces as no slag adhered but they clearly had been subject to intense heat. Many other fragments were also badly heat affected. The remains were found within feature [1008] and associated features, with a particular concentration in pit [1004].

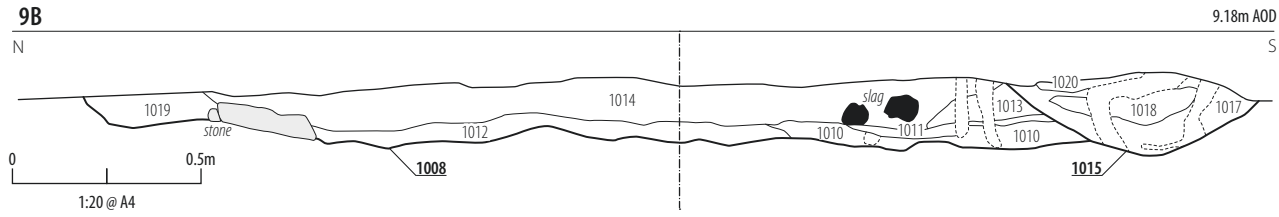
Metalwork

The single iron object was found in pit [1025] associated with only a very small amount of industrial waste. It is not clear therefore whether this find is related to the industrial activity and therefore a potential product of the workshop. It may be completely unrelated, though the possibility must remain that this represents a product or unfinished object of the workshop. Its form is obscured by corrosion but it may be the tip of a blade or tool of some kind.

Discussion

The assemblage clearly indicates the remains of an ironworking activity centred around feature [1008] and pit [1004], probably undertaking both smithing and smelting. The finding of hearth cakes in outlying pit [1021] is interesting as the lack of associated fired clay and magnetic residues imply there was no industrial activity in this area and therefore that this may have been a deliberate deposition away from the workshop.

While there is nothing at present to date the site with any precision, it would fit into the existing picture of Iron Age iron production known around the Moray Firth.



ILLUS 8 E facing section of waste pit [1004] **ILLUS 9** W facing section of industrial spread [1008]

6.4 ENVIRONMENTAL SAMPLE ASSESSMENT

Introduction

Nine samples, ranging in volume from three to 50 litres, were recovered during archaeological work in relation to a new road link between the A96 and Waterford Road at Forres. Samples were taken from the fills of various pits and deposits associated with industrial activity. The features have been interpreted as being Iron Age in date. The aims of the assessment were to assess the presence, preservation and abundance of any environmental remains in the samples and to characterize the assemblage in order to contribute to the understanding of the character and development of the site.

Method

Bulk samples were subjected to flotation and wet sieving in a Siraf-style flotation machine. The floating debris (the flot) was collected in a 250 µm sieve and once dry, scanned using a binocular microscope. Any material remaining in the flotation tank (retent) was wet-sieved through a 1mm mesh and air-dried. All samples were scanned using a stereomicroscope at magnifications of x10 and up to x100. Identifications, where provided, were confirmed using modern reference material and seed atlases including Cappers et al. (2006) and Zohary et al. (2012). After careful consideration of the uncharred seeds present in the samples they were determined to be a modern intrusive component and were therefore not considered further.

Results

Results of the assessment are presented in Tables A3.1 (Retent samples) and 2 (Flot samples). Material suitable for AMS (Accelerated Mass Spectrometry) radiocarbon dating is shown in the tables. The majority of samples had varying proportions of modern roots and occasional intrusive uncharred seeds.

Wood charcoal

Wood charcoal was present in varying quantities in all nine samples (Tables A3.1 and 2). The charcoal was generally abraded and fragmented.

Cereal grain

Cereal grain was present in only one sample (Tables A3.1 and 2) the primary fill (1022) of pit [1021]. The grain was predominantly hulled barley (Hordeum vulgare) with occasional indet. cereal grains. The grains exhibited mixed levels of preservation ranging from excellent to very poor. The better preserved barley grains were still encased in their hulls.

Hazelnut shell

Charred hazel nutshell fragments were recovered from the primary fill (1022) of pit [1021] (Tables A3.1 and 2).

Other charred plant remains

A number of charred 'weed seeds', (here used to include seeds, fruits, achene, caryopses etc.) were recovered from the primary fill (1022) of pit [1021]. Of the weed taxa present the majority were grasses (Poaceae), with occasional occurrences of Black-bindweed (Fallopia convolvulus) and goosefoots (Chenopodium sp.) These

ILLUS10 Recording of industrial spread [1008] **ILLUS 11** SW facing shot of large pit [1021] **ILLUS 12** N facing section of post-hole [1028]

weed taxa are all species common in arable fields and disturbed ground (Stace 1997).

Bone

Animal bone fragments were recovered from the retents of two samples (Table A3.1). The remains from both samples were burnt and comprised fragments that were unable to be identified.

Other finds

Finds including industrial waste, metalwork and ceramic building material will be discussed as the subject of a separate finds report.

Discussion

The charred plant remains provide some, limited, evidence for agricultural practices and possibly crop choices in the vicinity during the Iron Age period. The assemblage appears typical for this period with hulled barley as the main crop.

The most common causes of grain becoming charred are during a conflagration event. During the Iron Age it was not uncommon for the edges of grain storage pits to be subjected to intense heat from fires in order to decrease the risk of insect infestation. The presence of carbonised grains within the primary fill (1022) of pit [1022] could be used to infer its initial function as a grain storage pit that had been heat treated prior to use.

A grain storage pit will only function as satisfactory storage as long as the contents of the pit remain hermetically sealed. Once the seal is broken the environment within the pit is compromised and is no longer suitable for sustained use. Given that the upper fill of the pit contained industrial waste, suggests that once the cereal grain was utilized the pit was re-used for rubbish disposal.

The weed seeds recovered undoubtedly reflect the local flora. The majority of plant remains for example goosefoots and grasses are typical of cultivated and disturbed ground. It is therefore likely that they were growing at the site, or incidentally collected with fuelwood or cereal crops.

The fact that pit [1022] was the only excavated feature to yield cereal remains, and that it was located at a distance from the features associated with the Iron Age metal working industry, suggests that that there may potentially be other associated structures in the vicinity of the pit that were located outside the limits of the excavation trench. Such features and/or structures that typically generate quantities of charred cereal grain could include drying kilns, other storage structures or dwellings.

Dating potential of the remains

Seven samples contain material suitable for AMS dating the samples and material type are listed in Tables A3.1 and 2.

Recommendations

Given the size of both the charcoal and cereal grain assemblage, further analysis would provide little additional information on the nature of Iron Age agrarian economy. In the event that further archaeological works are required in the vicinity of the storage pit, it is recommended that a full program of sampling be developed in collaboration with the Environmental department. This should

enable the environmental data to be used to its full potential in contributing to the understanding of the site and in creating a detailed site narrative.

7 DISCUSSION

The results of the watching brief undertaken at Waterford Road differ slightly from expectations based on the aerial photograph provided (Illus 2), however it is clear from both this photograph and ground works that the river and flooding have played a large part in forming and altering this landscape. Many of the archaeologically suspicious crop marks on site have been ground-truthed as palaeochannels and gravelly deposits as the result of an old river course (also visible as crop marks). A large flooding event - the Muckle Spate (McEwen & Werritty 2007) – affected this area in 1829, providing a thick layer of alluvium across the area and diverting pre-existing water courses. It may in fact have helped preserve the archaeological remains, although deep-ploughing across site will certainly have been detrimental.

The archaeological works suggest that the hypothesis of prehistoric settlement in this area is highly likely. English Heritage's guide to Archaeometallurgy (2015) describes the archaeological debris associated with bloomery smelting, including 'Fuel, ore, vitrified furnace lining, and large slag blocks. Hammerscale can also be found'. This compares well with the assemblage retrieved from site, giving a potential use-date of 8th century BC – AD 16th century. Whilst this does not prove a prehistoric origin to the feature, other similar Iron Age features in the vicinity do support dating to this period. There is no evidence of any more advanced iron smelting on-site.

Feature [1008] is very similar in shape and assemblage to those found on both the Aberdeen Western Peripheral Route (Van Wessel, unpublished) and Bellfield Farm, North Kessock (Murray 2011). The industrial feature from AWPR showed a similar main pit with external rake-outs, and contained an assemblage including iron slag, furnace lining and in situ burnt deposits with large quantities of charcoal, being carbon dated to the Middle Iron Age (AD 18–130 cal). The furnace at Bellfield Farm followed a similar style, being dated to the middle Iron Age, 397–207 cal BC. Both of the above comparative sites' furnaces were found in conjunction with, or on the periphery of a larger settlement area, therefore suggesting there is high potential a settlement site in the immediate vicinity.

The appearance of burnt cereal grain on site found in pit [1021] further supports the idea of an Iron Age settlement with agriculture in very close proximity, the iron slag in the upper deposit of the pit suggesting a relatively close date to that of the furnace [1008]. As the environmental report suggests, this may have been used for grain storage prior to becoming a waste pit, however this is unclear from the physical evidence remaining. In addition the slag blocks and hammerscale within fill (1024) are indicative of iron smithing on site alongside the excavated smelting area, suggesting an ironworking workshop on-site.

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9 APPENDICES

APPENDIX 1 SITE REGISTERS

Appendix 1.1 Context register

CONTEXT	L (M)	W (M)	D (M)	DESCRIPTION
1001	–	–	0.3–0.4	Mid-brown silt topsoil with abundant manganese deposits, and modern pottery.
1002	–	–	0.3–0.4	Orange-brown silty sand subsoil with abundant manganese deposits throughout. Result of deep ploughing.
1003	–	–	–	Yellow sand with large (0.1-0.2m) cobble patches. Manganese and iron-pan present. Large amount of burrowing creating a diffuse interface with subsoil.
1004	1.6	1.3	0.13	Cut of sub-circular pit with gently sloping sides, a flat base and imperceptible breaks of slope. Dump for Iron-working waste.
1005	1.6	1.3	0.13	Mid brown sandy silt fill of pit [1004] with abundant charcoal, large slag deposits and orange daub throughout.
1006	0.6	0.55	0.3	Cut of sub-circular pit with fairly steep sides, a rounded base and sharp breaks of slope. Possible post-hole.
1007	0.6	0.55	0.3	Mid-brown sandy silt fill of pit [1006] with occasional charcoal and daub fragments throughout.
1008	3.35	0.91	0.23	Figure-of-eight cut of metalworking furnace with gently sloping sides, a flat stony base and gradual breaks of slope. Likely Prehistoric.
1009	0.25	0.2	0.05	Mid-orange daub deposit within furnace [1008], possibly in situ remains of structural daub.
1010	0.8	–	0.06	Mid-yellow sand deposit at base of furnace [1008]. Rake-out of material with frequent charcoal flecks.
1011	0.45	–	0.03	Dark brown-black sandy silt charcoal-rich rake-out associated with furnace [1008].
1012	1.15	–	0.06	Dark grey-brown sandy silt with abundant charcoal associated with furnace [1008] and rake-out (1011).
1013	0.23	–	0.07	Mid-yellow sand deposit with frequent charcoal flecks, overlying rake-out (1011).
1014	3.02	0.91	0.18	Mid brownish-grey sandy silt with abundant charcoal and frequent slag and daub.
1015	0.65	–	0.22	Sub-circular cut of re-use of furnace [1008] with gently sloping sides, a flat base and clear breaks of slope.
1016	–	–	–	Void
1017	0.65	–	0.19	Mid pinkish-brown burnt sand deposit within base of re-cut [1015] of furnace.
1018	0.38	0.3	0.08	Dark brown and black sandy silt with abundant charcoal, occasional daub and slag. In-situ final firing deposit overlying (1017).
1019	0.28	–	0.1	Dark greyish-brown silty sand waste deposit in northern extent of [1008], with abundant charcoal, large slag blocks and frequent daub.
1020	0.33	–	0.03	Mid-dark brown sandy silt with occasional charcoal flecks. Post-use fill sealing [1015].
1021	3.1	2.75	0.42	Cut of large sub-circular pit with gently sloping sides, a flat base and clear breaks of slopes. For disposal of industrial waste.
1022	2.5	1.95	0.14	Dark grey-brown sandy silt primary fill of pit [1021] with abundant charcoal and rare burnt bone flecks.
1023	3	2.75	0.25	Light yellowish-orange silty sand with occasional charcoal streaks. Secondary fill of pit [1021], deliberate backfilling.
1024	3.1	2.75	0.15	Greyish orange sandy silt with occasional large slag pieces and large quartz fragment. Tertiary fill of pit [1021], dump of metalworking waste.
1025	0.53	0.5	0.15	Cut of sub-circular pit with gently sloping sides, rounded base and gradual breaks of slope.
1026	0.4	0.4	0.03	Dark brown sandy silt deposit with abundant charcoal, occasional burnt bone and slag, within pit [1025]. Heavily burrowed interface with natural.
1027	0.34	0.34	0.06	Yellowish brown sandy silt secondary fill of pit [1025] with occasional charcoal. Final deposit.
1028	0.36	0.35	0.16	Cut of circular post-hole with steep sides and a flat base, containing a post-pipe.
1029	0.36	0.36	0.16	Redeposited orange-yellow sand into post-hole.
1030	0.28	0.28	0.16	Mid-brown silt fill of post-pipe within post-hole [1028].
1031	0.4	0.4	0.24	Sub-circular cut of post-hole with steep sides, a pointed base and clear breaks of slope.
1032	0.4	0.4	0.24	Mid-brown sandy silt fill of post-hole [1031] with occasional charcoal flecks.
1033	0.55	0.55	0.16	Sub-rectangular cut of pit with step sides, flat base and sharp breaks of slope. Unknown function.
1034	0.55	0.55	0.16	Mid orange-brown silty sand fill of pit [1034] with rare charcoal flecks. Backfilled post-abandonment.

Appendix 1.2 Photographic register

SHOT	DIRECTION	DESCRIPTION
WRFM-1001	N	Pre-condition survey of area to be stripped
WRFM-1002	NW	Pre-condition survey of area to be stripped
WRFM-1003	W	Pre-condition survey of area to be stripped
WRFM-1004	W	Pre-condition survey of area to be stripped including haul road
WRFM-1005	SW	Pre-condition survey of area to be stripped including haul road
WRFM-1006	SW	Pre-condition survey of area to be stripped

SHOT	DIRECTION	DESCRIPTION
WRFM-1007	SW	Pre-condition survey of area to be stripped
WRFM-1008	W	Pre-condition survey of area to be stripped
WRFM-1009	NW	Pre-condition survey of area to be stripped
WRFM-1010	N	Pre-condition survey of area to be stripped
WRFM-1011	NE	Pre-condition survey of area to be stripped
WRFM-1012	NE	Pre-condition survey of area to be stripped
WRFM-1013	E	Pre-condition survey of area to be stripped
WRFM-1014	SE	Pre-condition survey of area to be stripped
WRFM-1015	S	Pre-condition survey of area to be stripped
WRFM-1016	N	Excavated area
WRFM-1017	NW	Excavated area
WRFM-1018	W	Excavated area
WRFM-1019	N	Excavated area
WRFM-1020	NE	Excavated area
WRFM-1021	NE	Excavated area
WRFM-1022	S	Test-hole excavation
WRFM-1023	S	Test-hole excavation
WRFM-1024	S	Test-hole excavation
WRFM-1025	N	Test-hole excavation
WRFM-1026	N	Test-pit 4
WRFM-1027	N	Test-pit 3
WRFM-1028	N	Test-pit 2
WRFM-1029	N	Test-pit 1
WRFM-1030	W	Working shot
WRFM-1031	W	Working shot
WRFM-1032	N	Test-pit 5
WRFM-1033	N	Test-pit 6
WRFM-1034	N	Test-pit 7
WRFM-1035	N	Test-pit 8
WRFM-1036	N	Test-pit 9
WRFM-1037	N	Test-pit 10
WRFM-1038	N	Test-pit 11
WRFM-1039	S	Working shot
WRFM-1040	W	Excavated area
WRFM-1041	NW	Excavated area
WRFM-1042	NW	Excavated area
WRFM-1043	N	Excavated area
WRFM-1044	W	Excavated area

SHOT	DIRECTION	DESCRIPTION
WRFM-1045	NW	Excavated area
WRFM-1046	NE	Excavated area
WRFM-1047	NE	Excavated area
WRFM-1048	NW	Excavated area
WRFM-1049	W	Excavated area
WRFM-1050	SE	Excavated area
WRFM-1051	E	Excavated area
WRFM-1052	NE	Excavated area
WRFM-1053	N	Excavated area
WRFM-1054	N	Excavated area
WRFM-1055	NW	Excavated area
WRFM-1056	W	Plough marks in natural
WRFM-1057	W	Plough marks in natural
WRFM-1058	W	Plough marks in natural
WRFM-1059	W	Excavated area
WRFM-1060	SW	Excavated area
WRFM-1061	W	Excavated area
WRFM-1062	W	Excavated area
WRFM-1063	N	Bird on site
WRFM-1064	E	Excavated area
WRFM-1065	SE	Excavated area
WRFM-1066	SW	Excavated area
WRFM-1067	N	Excavated area
WRFM-1068	N	Pre-ex of potential archaeology (Pits [1004], [1006], [1008], [1015])
WRFM-1069	N	Pre-ex of potential archaeology (Pits [1004], [1006], [1008], [1015])
WRFM-1070	SE	Pre-ex of potential archaeology (Pits [1004], [1006], [1008], [1015])
WRFM-1071	SE	Pre-ex of potential archaeology (Pits [1004], [1006], [1008], [1015])
WRFM-1072	W	Iron slag found during machining (Pit [1021])
WRFM-1073	SW	Excavated area
WRFM-1074	W	Working shot
WRFM-1075	N	Excavated area
WRFM-1076	W	Pre-ex of potential archaeology ([1021])
WRFM-1077	E	Pre-ex of potential archaeology ([1021])
WRFM-1078	E	Modern horse burial
WRFM-1079	N	Modern horse burial
WRFM-1080	NE	Post-ex of pit [1021]

SHOT	DIRECTION	DESCRIPTION
WRFM-2001	W	Pre-ex of pit [1004]
WRFM-2002	W	Pre-ex of pit [1008]
WRFM-2003	NNW	Pre-ex of pits [1008] and [1004]
WRFM-2004	NNW	Pre-ex of pits [1008] and [1004]
WRFM-2005	N	Working shot
WRFM-2006	N	Working shot
WRFM-2007	NE	Working shot
WRFM-2008	NE	Working shot
WRFM-2009	E	Working shot
WRFM-2010	E	Working shot
WRFM-2011	E	Working shot
WRFM-2012	E	Working shot
WRFM-2013	N	South-facing section of pit [1004]
WRFM-2014	N	South-facing section of pit [1004]
WRFM-2015	W	East-facing section of pit [1004]
WRFM-2016	S	North-facing section of pit [1004]
WRFM-2017	E	W-facing section of pit [1004]
WRFM-2018	N	General shot of pit [1004]
WRFM-2019	N	General shot of pit [1004]
WRFM-2020	SE	North-west facing section of pit [1006]
WRFM-2021	SE	General shot of pits [1006] and [1004]
WRFM-2022	N	Excavated area to north of overheads
WRFM-2023	N	Excavated area to north of overheads
WRFM-2024	N	Excavated area to north of overheads
WRFM-2025	N	Excavated area to north of overheads
WRFM-2026	N	Pre-ex of pit [1021]
WRFM-2027	N	Excavated area to north of overheads
WRFM-2028	N	Excavated area to north of overheads
WRFM-2029	S	Alignment of modern posts/horse burial
WRFM-2030	N	Excavated area to north of overheads
WRFM-2031	S	Excavated area to north of overheads
WRFM-2032	–	Birds
WRFM-2033	–	Birds
WRFM-2034	–	Birds
WRFM-2035	–	Birds
WRFM-2036	–	Birds
WRFM-2037	–	Birds
WRFM-2038	W	Working shot

SHOT	DIRECTION	DESCRIPTION
WRFM-2039	SW	Working shot
WRFM-2040	W	East-facing section of furnace [1008]
WRFM-2041	W	East-facing section of furnace [1008]
WRFM-2042	W	East-facing section of furnace [1008]
WRFM-2043	S	North-facing section of furnace [1008]
WRFM-2044	S	North-facing section of furnace [1008], detail
WRFM-2045	S	North-facing section of furnace [1008], detail
WRFM-2046	SW	General shot of furnace [1008], mid-ex
WRFM-2047	SW	General shot of furnace [1008], mid-ex
WRFM-2048	W	East-facing section of Furnace [1008]
WRFM-2049	ESE	Daub (1009) within furnace [1008] - possibly structural?
WRFM-2050	NE	Daub (1009) within furnace [1008] - possibly structural?
WRFM-2051	ESE	Daub (1009) - detail
WRFM-2052	NE	Mid-ex of furnace [1008] and daub (1009)
WRFM-2053	NE	Working shot
WRFM-2054	NE	Working shot
WRFM-2055	SE	Working shot
WRFM-2056	SE	Working shot
WRFM-2057	SE	Working shot
WRFM-2058	SE	Working shot
WRFM-2059	SW	Working shot
WRFM-2060	SW	Working shot
WRFM-2061	NE	Working shot
WRFM-2062	E	West-facing section of pits [1008] and [1015]
WRFM-2063	E	West-facing section of pits [1008] and [1015]
WRFM-2064	E	West-facing section of pits [1008] and [1015]
WRFM-2065	E	Detail of re-cut [1015]
WRFM-2066	E	West-facing section of pits [1008] and [1015] - detail
WRFM-2067	E	Northern extent of west-facing section of furnace [1008]
WRFM-2068	NE	Oblique of furnace [1008] and re-cut [1015]
WRFM-2069	NE	Oblique of furnace [1008] and re-cut [1015]
WRFM-2070	NE	Oblique of furnace [1008] and re-cut [1015]
WRFM-2071	N	South-facing section of furnace [1008]
WRFM-2072	N	South-facing section of furnace [1008] - detail
WRFM-2073	N	South-facing section of furnace [1008] - detail
WRFM-2074	E	Shot of burrowing - extensive across entire site
WRFM-2075	SW	Working shot
WRFM-2076	N	Working shot

SHOT	DIRECTION	DESCRIPTION
WRFM-2077	N	Working shot
WRFM-2078	N	Working shot
WRFM-2079	N	Working shot
WRFM-2080	N	Working shot
WRFM-2081	SW	Working shot
WRFM-2082	E	Detail of re-cut [1015]
WRFM-2083	E	Detail of re-cut [1015]
WRFM-2084	E	Detail of re-cut [1015]
WRFM-2085	E	West-facing section of pit [1021] - Detail
WRFM-2086	E	West-facing section of pit [1021] - Detail
WRFM-2087	E	West-facing section of pit [1021] - General
WRFM-2088	E	West-facing section of pit [1021] - General
WRFM-2089	N	South-facing section of pit [1021] - Detail
WRFM-2090	N	South-facing section of pit [1021] - Detail
WRFM-2091	N	South-facing section of pit [1021] - General
WRFM-2092	N	South-facing section of pit [1021] - General
WRFM-2093	W	East-facing section of pit [1021] - Detail
WRFM-2094	W	East-facing section of pit [1021] - Detail
WRFM-2095	W	East-facing section of pit [1021] - General
WRFM-2096	W	East-facing section of pit [1021] - General
WRFM-2097	S	North-facing section of pit [1021] - General
WRFM-2098	S	North-facing section of pit [1021] - Detail
WRFM-2099	S	North-facing section of pit [1021] - Detail
WRFM-2100	S	North-facing section of pit [1021] - Detail
WRFM-2101	S	North-facing section of pit [1021] - Detail
WRFM-2102	SW	General Shot of pit [1021]
WRFM-2103	SW	General Shot of pit [1021]
WRFM-2104	SE	General Shot of pit [1021]
WRFM-2105	SE	General Shot of pit [1021]
WRFM-2106	SE	General Shot of pit [1021]
WRFM-2107	NE	General Shot of pit [1021]
WRFM-2108	NW	General Shot of pit [1021]
WRFM-2109	SW	Working shot
WRFM-2110	SW	Stripped area
WRFM-2111	W	Stripped area
WRFM-2112	W	Stripped area
WRFM-2113	W	Stripped area
WRFM-2114	NW	SE-facing section of pit [1025] - Detail
WRFM-2115	NW	SE-facing section of pit [1025] - General
WRFM-2116	SE	NW-facing section of pit [1028]
WRFM-2117	SE	NW-facing section of pit [1028] - General
WRFM-2118	NNW	SSE-facing section of post-hole [1031]
WRFM-2119	N	South-facing section of pit [1033]
WRFM-2120	N	South-facing section of pit [1033]
WRFM-2121	N	South-facing section of pit [1033] with pit [1021]

Appendix 1.3 Drawing register

DRAWING	DESCRIPTION
1001	East and west-facing sections of pits [1008] and [1015]
1002	North and south-facing sections of pits [1008] and [1015]
1003	East and west-facing sections of pit [1021]
1004	North and south-facing sections of pit [1021]
1005	South-east facing section of pit [1025]
1006	North-west facing section of post-hole [1028]

Appendix 1.4 Sample register

SAMPLE	CONTEXT	DESCRIPTION	VOL. (L)
1001	1005	Fill of pit [1004] - charcoal, daub, slag - enviro/dating/finds	40
1002	1007	Fill of pit [1006] - charcoal, daub, slag	10
1003	1014	Abandonment layer of pit [1008] - charcoal, daub, slag	40
1004	1011	Rake-out of pit [1008] - charcoal, daub, slag	1
1005	1019	Fill of pit [1008] - charcoal, daub, slag	10
1006	1018	In-situ burning in pit [1015] - charcoal, daub, slag	5
1007	1012	Basal fill of pit [1008] - charcoal, daub, slag	5
1008	1022	Basal fill of pit [1021] - charcoal, daub, burnt bone	50
1009	1026	Basal fill of pit [1025] - Charcoal, bone	5

APPENDIX 2 FINDS CATALOGUE

CONTEXT	FEATURE	SAMPLE	QTY	WGT (G)	MATERIAL	OBJECT	DESCRIPTION
1002	subsoil 1002	–	1	391	Industrial Waste	Slag	Small to medium amorphous lumps of slag, including a piece of runned slag
1005	pit 1004	1001	300	2299	Industrial Waste	Slag	Small amorphous lumps of slag, including some pieces of runned slag, fuel impression present on largest piece
1005	pit 1004	–	66	2159	Industrial Waste	Slag	Small to medium amorphous lumps of slag, including some runned slag
1005	pit 1004	–	27	865	CBM	Burnt Clay	Small to large fragments, some furnace wall fragments present due to the burnt interior surface, some embedded charcoal present on two fragments
1005	pit 1004	1001	56	416	CBM	Burnt Clay	Small to large fragments, some furnace wall fragments present due to the burnt interior surface, some embedded charcoal present on one fragment, finger impression present on one fragment
1005	pit 1004	1001	–	44	Industrial Waste	Mag Res	Possible hammerscale
1007	pit 1006	1002	250	786	Industrial Waste	Slag	Small amorphous lumps of slag, including some pieces of runned slag, fuel impression present
1007	pit 1006	1002	19	47	CBM	Burnt Clay	Small fragments, evidence of burnt surface on some of them
1007	pit 1006	1002	–	31	Industrial Waste	Mag Res	Possible hammerscale
1009	industrial spread 1008	–	250	173	CBM	Burnt Clay	Small fragments
1011	industrial spread 1008	–	32	468	Industrial Waste	Slag	Small amorphous lumps of slag, including some pieces of runned slag
1011	industrial spread 1008	1004	250	269	Industrial Waste	Slag	Small amorphous lumps of slag, including some pieces of runned slag
1011	industrial spread 1008	–	7	102	CBM	Burnt Clay	Small to medium fragments, vitrified furnace wall fragment present
1011	industrial spread 1008	1004	–	35	Industrial Waste	Mag Res	Possible hammerscale
1011	industrial spread 1008	1004	2	9	CBM	Burnt Clay	Small fragments, evidence of burnt surface on one side
1012	industrial spread 1008	–	25	265	Industrial Waste	Slag	Small amorphous lumps of slag, including some pieces of runned slag
1012	industrial spread 1008	1007	35	78	Industrial Waste	Slag	Small amorphous lumps of slag, including some pieces of runned slag
1012	industrial spread 1008	1007	–	7	Industrial Waste	Mag Res	Possible hammerscale
1012	industrial spread 1008	1007	5	5	CBM	Burnt Clay	Small fragments, evidence of burnt surface on one side
1014	industrial spread 1008	1003	150	2520	Industrial Waste	Slag	Small to medium amorphous lumps of slag, including some runned slag, fired clay attached to several pieces
1014	industrial spread 1008	–	35	645	Industrial Waste	Slag	Small amorphous lumps of slag, including some pieces of runned slag, fuel impression present on one piece
1014	industrial spread 1008	1003	87	136	CBM	Burnt Clay	Small to medium fragments, evidence of burnt surface on some of them
1014	industrial spread 1008	1003	–	97	Industrial Waste	Mag Res	Possible hammerscale
1014	industrial spread 1008	–	4	54	CBM	Burnt Clay	Medium fragments, evidence of burnt surface on one side
1018	pit 1015	1006	55	144	Industrial Waste	Slag	Small amorphous lumps of slag, including some pieces of runned slag
1018	pit 1015	1006	–	43	Industrial Waste	Mag Res	Possible hammerscale
1018	pit 1015	1006	28	21	CBM	Burnt Clay	Small fragments
1019	industrial spread 1008	1005	175	1627	Industrial Waste	Slag	Small to medium amorphous lumps of slag, including some runned slag, fired clay attached to several pieces
1019	industrial spread 1008	–	50	436	Industrial Waste	Slag	Small amorphous lumps of slag, including some pieces of runned slag, fuel impression present on one piece
1019	industrial spread 1008	1005	34	36	CBM	Burnt Clay	Small to medium fragments
1019	industrial spread 1008	1005	–	25	Industrial Waste	Mag Res	Possible hammerscale
1020	pit 1015	–	3	182	Industrial Waste	Slag	Small amorphous lumps of slag, including some pieces of runned slag

CONTEXT	FEATURE	SAMPLE	QTY	WGT (G)	MATERIAL	OBJECT	DESCRIPTION
1022	pit 1021	1008	13	16	Industrial Waste	Slag	Small amorphous lumps of slag, including some pieces of runned slag
1022	pit 1021	1008	–	1	Industrial Waste	Mag Res	Possible hammerscale
1024	pit 1021	–	3	3026	Industrial Waste	Slag	Plano-convex hearth-cakes, two smaller in size than the other
1026	pit 1025	1009	1	5	Industrial Waste	Slag	Small amorphous piece of runned slag
1026	pit 1025	1009	–	0	Industrial Waste	Mag Res	Possible hammerscale
1027	pit 1025	–	1	24	Iron	Object	corroded object, possibly a blade tip or wrought iron nail

APPENDIX 3 ENVIRONMENTAL TABLES

TABLE A3.1 Retent sample results

CONTEXT	SAMPLE	FEATURE	SAMPLE VOL (L)	CBM	STONE	INDUSTRIAL WASTE		BURNT BONE	CHARRED SEEDS	CHARRED CEREAL GRAIN	CHARRED NUTSHELL	CHARCOAL		MATERIAL AVAILABLE FOR AMS	COMMENTS
				Daub	Lithics	Fe slag	Mag res	Mammal				Qty	Max Size (cm)		
1005	1001	Fill of pit [1004]	40	+++	+	++++	++++	–	–	–	–	+++	3.0	Charcoal ++	–
1007	1002	Fill of pit [1006]	10	++	–	+++	++++	–	–	–	–	+	0.6	–	–
1014	1003	Mixed sealing layer overlying (1012) and (1013)	40	+++	++	++++	++++	–	–	–	–	++	1.0	Charcoal +	–
1011	1004	Charcoal rakeout associated with furnace [1008]	3	+	–	++++	++++	–	–	–	–	+	1.0	Charcoal +	–
1019	1005	Silty slag deposit in northern extent of [1008]	10	+++	–	+++	++++		–	–	–	+++	2.2	Charcoal ++	–
1018	1006	In-situ burnt deposit overlying (1017)	3	+++	–	++++	++++	–	–	–	–	+	1.5	Charcoal +	–
1012	1007	Fill of pit [1006]	6	+	–	++	++++	–	–	–	–	++	1.2	Charcoal +	–
1022	1008	Primary fill of pit [1021]	50	+	–	++	++	+++	+	++++	+	++++	2.0	Burnt bone +++, Charcoal ++++, Cereal Grain ++++, Nutshell +	Retent retained. Hulled barley grains, Hazel nutshell fragments. Burnt bone fragments - mammal (18.4g)
1026	1009	Primary fill of pit [1025]	10	–	–	+	+	+++	–	–	–	++	1.4	Burnt bone ++, Charcoal +	Burnt bone fragments - mammal (12.3g)

Key: + = rare (0–5), ++ = occasional (6–15), +++ = common (15–50) and ++++ = abundant (>50)

NB charcoal over 1cm is suitable for identification and AMS dating

TABLE A3.2 Flotation sample results

CONTEXT	SAMPLE	FEATURE	TOTAL FLOT VOL (ML)	BARLEY	INDET. CEREAL	WEEDS	HAZEL NUTSHELL	CHARCOAL		MATERIAL AVAILABLE FOR AMS	COMMENTS
								Qty	Max size (mm)		
1005	1001	Fill of pit [1004]	400	–	–	–	–	++++	24	Yes	No charred plant remains present
1007	1002	Fill of pit [1006]	125	–	–	+	–	++++	15	Yes	single indet. weed seed
1014	1003	Mixed sealing layer overlying (1012) and (1013)	18	–	–	–	–	++++	18	Yes	No charred plant remains present
1011	1004	Charcoal rakeout associated with furnace [1008]	3	–	–	–	–	+++	16	Yes	No charred plant remains present
1019	1005	Silty slag deposit in northern extent of [1008]	10	–	–	–	–	+++	13	Yes	No charred plant remains present
1018	1006	In-situ burnt deposit overlying (1017)	1	–	–	–	–	++	8	No	No charred plant remains present
1012	1007	Fill of pit [1006]	1	–	–	–	–	++	4	No	No charred plant remains present
1022	1008	Primary fill of pit [1021]	310	++++	++	++++	+	++++	17	Yes	Hulled barley, cereal grain rich sample
1026	1009	Primary fill of pit [1025]	16	–	–	+	–	+++	14	Yes	Polygonaceae, Poaceae > 2mm

Key: + = rare (1–5), ++ = occasional (6–15), +++ = common (16–50) and ++++ = abundant (>50)

NB charcoal over 1cm is suitable for identification and AMS dating

APPENDIX 4 DISCOVERY AND EXCAVATION IN SCOTLAND ENTRY

LOCAL AUTHORITY:	Moray Council
PROJECT TITLE/SITE NAME:	Archaeological Watching Brief at Waterford Road, Forres, Moray
PROJECT CODE:	WRFM16-01
PARISH:	Forres
NAME OF CONTRIBUTOR:	Josh Gaunt
NAME OF ORGANISATION:	Headland Archaeology (UK) Ltd
TYPE(S) OF PROJECT:	Watching Brief
NMRS NO(S):	–
SITE/MONUMENT TYPE(S):	–
SIGNIFICANT FINDS:	Iron age iron-smelting furnace, smithing debris.
NGR (2 LETTERS, 8 OR 10 FIGURES)	NJ 02841 59186
START DATE (THIS SEASON)	6th June 2016
END DATE (THIS SEASON)	17th June 2016
PREVIOUS WORK (INCL. DES REF.)	None
MAIN (NARRATIVE) DESCRIPTION: (MAY INCLUDE INFORMATION FROM OTHER FIELDS)	Headland Archaeology (UK) Ltd undertook a watching brief for construction of a new road link between the A96 and Waterford Road at Forres by Network Rail. The purpose of the work was to establish the presence of archaeological features or deposits within the area of ground breaking, and to fully record all archaeologically significant features as set out in the CIfA Standards and Guidance documentation. Several post-holes and pits were uncovered and excavated, including a series of pits relating to the on-site smelting and smithing of iron-ore; and the disposal of waste materials, both agricultural and industrial. These appear Iron-age in date, indicating the possibility of Iron-age settlement in the vicinity.
PROPOSED FUTURE WORK:	None
CAPTION(S) FOR ILLUSTRS:	–
SPONSOR OR FUNDING BODY:	Network Rail
ADDRESS OF MAIN CONTRIBUTOR:	13 Jane Street, Edinburgh, EH6 5HE, Scotland
EMAIL ADDRESS:	josh.gaunt@headlandarchaeology.com
ARCHIVE LOCATION (INTENDED/DEPOSITED)	Archive to be deposited in NMRS

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